REMARKS:

In the Claims:

The examiner has rejected claim 25 as being anticipated by Komoru et al, US Patent 6,327,107. Koromu teaches (for example in Fig. 5, a tunnel junction sensor having a sensor stack that includes a free layer, a pinned layer and a non-magnetic barrier layer. A ferromagnetic bias layer (element 7) provides a bias field to bias the magnetization of the free layer (element 3). As stated in column 4, lines 29-32 of Koromu, the bias layer (magnetic domain control film 7) is a, "ferromagnetic film for applying a bias magnetic field to the free layer 3". The bias layer is, therefore, not an anitferromagnetic layer (AFM).

The Examiner has also rejected claims 29 and 32 as being anticipated by Carey, et al., US Patent No. 6,836,392. Carey also discloses a ferromagnetic bias layer located outside of the active region. This bias layer (161) is described in column 11, lines 45 through 47 as being a coercive ferrite such as Co_2FeO_4. As those skilled in the art will recognize, a coercive ferrite such as Co_2FeO_4 is not an antiferromagnetic material (AFM). A coercive ferrite is a magnetic material having a magnetic moment and a high coercivity, such that once its magnetization is set it is not easily changed. The magnetization of this ferromagnetic material provides a magnetic field which biases the magnetization of the free layer. An AFM material in and of itself is not magnetic at all. Examples of AFM materials include PtMn and IrMn. Although these materials do not in and of themselves have a magnetization (ie. they are not ferromagnetic), when they are exchange coupled with a magnetic material (such as that of the free layer) they strongly pin the magnetization of that portion of the magnetic layer. Therefore, it can be seen that neither Koromu, nor Carey teach the use of an AFM layer outside of the active area for biasing the free layer. In fact, by teaching that the biasing layers are ferromagnetic, they teach away from such as design.

The Applicant has amended claim 25, to recite that the bias layer is an AFM

layer, which is not taught by any of the references. Since these limitations were incorporated from claims 29 and 32, these claims (29 and 32) have been cancelled. Since none of the references teach such a structure as that of amended claim 25, wherein a bias layer constructed of an AFM layer is located outside of the active region, claim 25 is novel and allowable over the prior art.

Since claim 25 is allowable over the prior art, claims 26, 27 and 30, which depend from allowable claim 25 and add further limitation thereto must also be allowable over the prior art. In addition, new claim 47 has been added to further recite that the AFM bias layer is exchange coupled with the free layer in an area outside of the active region.

The Applicant sincerely believes that the remaining claims in the present application are now in condition for allowance. Accordingly, a notice of allowance is respectfully requested. In the event a telephone conversation would expedite the prosecution of this application, the Examiner may reach the undersigned at (408) 971-2573. For payment of any additional fees due in connection with the filing of this paper, the Commissioner is authorized to charge such fees to Deposit Account No. 50-1351 (Order No. HIT1P234).

Respectfully submitted,

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